

LISTING OF CLAIMS:

The present listing of claims replaces all prior listings or versions of claims in the present application.

1. (Previously Presented) A copper-based alloy casting comprising:
69 to 88% of Cu by mass;
2 to 5% of Si by mass;
0.0005 to 0.04% of Zr by mass;
0.01 to 0.25% of P by mass; and
a remainder including Zn and inevitable impurities, and
satisfying $60 \leq \text{Cu} - 3.5 \times \text{Si} - 3 \times \text{P} \leq 71$,
wherein mean grain size after melt-solidification is 100 μm or less, and α , κ and γ -phases occupy more than 80% of phase structure.

2. (Currently Amended) A copper-based alloy casting comprising:
69 to 88% of Cu by mass;
2 to 5% of Si by mass;
0.0005 to 0.04% of Zr by mass;
0.01 to 0.25% of P by mass;
at least one element selected from a group consisting of 0.001 to 0.2% of Mg, 0.003 to 0.1% of B, 0.0002 to 0.01% of C, 0.001 to 0.2% of Ti and 0.01 to 0.3% of rare earth element, by mass; and
a remainder including Zn and inevitable impurities, and

satisfying $60 \leq \text{Cu} - 3.5 \times \text{Si} - 3 \times \text{P} - 0.5 \times [\text{i}] + 0.5 \times [\text{ii}] \leq 71$, $[\text{i}]$ being a group consisting of Mg and B, and $[\text{ii}]$ being a group consisting of C, Ti and a rare earth element, wherein mean grain size after melt-solidification is 100 μm or less, and α , κ and γ -phases occupy more than 80% of phase structure.

3. (Previously Presented) A copper-based alloy casting comprising:
69 to 88% of Cu by mass;
2 to 5% of Si by mass;
0.0005 to 0.04% of Zr by mass;
0.01 to 0.25% of P by mass;
at least one element selected from a group consisting of 0.02 to 1.5% of Al, 0.2 to 4.0% of Mn and 0.01 to 0.2% of Cr, by mass; and
a remainder including Zn and inevitable impurities, and
satisfying $60 \leq \text{Cu} - 3.5 \times \text{Si} - 3 \times \text{P} - 1.8 \times \text{Al} + a \times \text{Mn} + 0.5\text{Cr} \leq 71$, wherein $a = 2$ in a case that Mn is contained more than 0.5% by mass and satisfies $0.2 \times \text{Si} \leq \text{Mn} \leq 2.0 \times \text{Si}$, and $a = 0.5$ in other cases,
wherein mean grain size after melt-solidification is 100 μm or less, and α , κ and γ -phases occupy more than 80% of phase structure.

4. (Currently Amended) A copper-based alloy casting comprising:
69 to 88% of Cu by mass;
2 to 5% of Si by mass;
0.0005 to 0.04% of Zr by mass;
0.01 to 0.25% of P by mass;

at least one element selected from a group consisting of 0.001 to 0.2% of Mg, 0.003 to 0.1% of B, 0.0002 to 0.01% of C, 0.001 to 0.2% of Ti and 0.01 to 0.3% of a rare earth element, by mass;

at least one element selected from a group consisting of 0.02 to 1.5% of Al, 0.2 to 4.0% of Mn and 0.01 to 0.2% of Cr, by mass; and

a remainder including Zn and inevitable impurities, and

satisfying $60 \leq \text{Cu} - 3.5 \times \text{Si} - 3 \times \text{P} - 0.5 \times [\text{i}] + 0.5 \times [\text{ii}] - 1.8 \times \text{Al} + \text{a} \times \text{Mn} + 0.5\text{Cr} \leq 71$, wherein $\text{a} = 2$ in a case that Mn is contained more than 0.5% by mass and satisfies $0.2 \times \text{Si} \leq \text{Mn} \leq 2.0 \times \text{Si}$, and $\text{a} = 0.5$ in other cases,

wherein mean grain size after melt-solidification is 100 μm or less, and α , κ and γ -phases occupy more than 80% of phase structure.

5. (Previously Presented) The copper-based alloy casting according to claim 1, further comprising:

at least one element selected from a group consisting of 0.1 to 2.5% of Sn, 0.02 to 0.25% of Sb and 0.02 to 0.25% of As, by mass.

6. (Previously Presented) The copper-based alloy casting according to claim 1, further comprising:

at least one element selected from a group consisting of 0.004 to 0.45% of Pb, 0.004 to 0.45% of Bi, 0.03 to 0.45% of Se and 0.01 to 0.45% of Te, by mass.

7. (Previously Presented) The copper-based alloy casting according to claim 1, wherein P/Zr is in the range of 0.8 to 250, Si/Zr is in the range of 80 to 6000, and Si/P is in the range of 12 to 220.

8. (Previously Presented) The copper-based alloy casting according to claim 1, wherein dendrites are crystallized, and the dendrites have shapes with no arms.

9. (Previously Presented) The copper-based alloy casting according to claim 1, wherein Fe, or Ni, or Fe and Ni, contained as impurities are contained at 0.5% or less by mass.

10. (Previously Presented) The copper-based alloy casting according to claim 1, wherein Zr is in the range of 0.0010 to 0.0095% by mass.

11. (Previously Presented) The copper-based alloy casting according to claim 2, further comprising:

at least one element selected from a group consisting of 0.1 to 2.5% of Sn, 0.02 to 0.25% of Sb and 0.02 to 0.25% of As, by mass.

12. (Previously Presented) The copper-based alloy casting according to claim 3, further comprising:

at least one element selected from a group consisting of 0.1 to 2.5% of Sn, 0.02 to 0.25% of Sb and 0.02 to 0.25% of As, by mass.

13. (Previously Presented) The copper-based alloy casting according to claim 4, further comprising:

at least one element selected from a group consisting of 0.1 to 2.5% of Sn, 0.02 to 0.25% of Sb and 0.02 to 0.25% of As, by mass.

14. (NEW) The copper-based alloy casting according to claim 2, further comprising:
at least one element selected from a group consisting of 0.004 to 0.45% of Pb, 0.004
to 0.45% of Bi, 0.03 to 0.45% of Se and 0.01 to 0.45% of Te, by mass.

15. (NEW) The copper-based alloy casting according to claim 3, further comprising:
at least one element selected from a group consisting of 0.004 to 0.45% of Pb, 0.004
to 0.45% of Bi, 0.03 to 0.45% of Se and 0.01 to 0.45% of Te, by mass.

16. (NEW) The copper-based alloy casting according to claim 5, further comprising:
at least one element selected from a group consisting of 0.004 to 0.45% of Pb, 0.004
to 0.45% of Bi, 0.03 to 0.45% of Se and 0.01 to 0.45% of Te, by mass.

17. (NEW) The copper-based alloy casting according to claim 11, further
comprising:

at least one element selected from a group consisting of 0.004 to 0.45% of Pb, 0.004
to 0.45% of Bi, 0.03 to 0.45% of Se and 0.01 to 0.45% of Te, by mass.

18. (NEW) The copper-based alloy casting according to claim 12, further
comprising:

at least one element selected from a group consisting of 0.004 to 0.45% of Pb, 0.004
to 0.45% of Bi, 0.03 to 0.45% of Se and 0.01 to 0.45% of Te, by mass.

19. (NEW) The copper-based alloy casting according to claim 2, wherein P/Zr is in the range of 0.8 to 250, Si/Zr is in the range of 80 to 6000, and Si/P is in the range of 12 to 220.

20. (NEW) The copper-based alloy casting according to claim 3, wherein P/Zr is in the range of 0.8 to 250, Si/Zr is in the range of 80 to 6000, and Si/P is in the range of 12 to 220.

21. (NEW) The copper-based alloy casting according to claim 5, wherein P/Zr is in the range of 0.8 to 250, Si/Zr is in the range of 80 to 6000, and Si/P is in the range of 12 to 220.

22. (NEW) The copper-based alloy casting according to claim 6, wherein P/Zr is in the range of 0.8 to 250, Si/Zr is in the range of 80 to 6000, and Si/P is in the range of 12 to 220.

23. (NEW) The copper-based alloy casting according to claim 2, wherein dendrites are crystallized, and the dendrites have shapes with no arms.

24. (NEW) The copper-based alloy casting according to claim 3, wherein dendrites are crystallized, and the dendrites have shapes with no arms.

25. (NEW) The copper-based alloy casting according to claim 5, wherein dendrites are crystallized, and the dendrites have shapes with no arms.

26. (NEW) The copper-based alloy casting according to claim 7, wherein dendrites are crystallized, and the dendrites have shapes with no arms.

27. (NEW) The copper-based alloy casting according to claim 2, wherein Fe, or Ni, or Fe and Ni, contained as impurities are contained at 0.5% or less by mass.

28. (NEW) The copper-based alloy casting according to claim 3, wherein Fe, or Ni, or Fe and Ni, contained as impurities are contained at 0.5% or less by mass.

29. (NEW) The copper-based alloy casting according to claim 5, wherein Fe, or Ni, or Fe and Ni, contained as impurities are contained at 0.5% or less by mass.

30. (NEW) The copper-based alloy casting according to claim 6, wherein Fe, or Ni, or Fe and Ni, contained as impurities are contained at 0.5% or less by mass.

31. (NEW) The copper-based alloy casting according to claim 11, wherein Fe, or Ni, or Fe and Ni, contained as impurities are contained at 0.5% or less by mass.

32. (NEW) The copper-based alloy casting according to claim 12, wherein Fe, or Ni, or Fe and Ni, contained as impurities are contained at 0.5% or less by mass.

33. (NEW) The copper-based alloy casting according to claim 2, wherein Zr is in the range of 0.0010 to 0.0095% by mass.

34. (NEW) The copper-based alloy casting according to claim 3, wherein Zr is in the range of 0.0010 to 0.0095% by mass.

35. (NEW) The copper-based alloy casting according to claim 5, wherein Zr is in the range of 0.0010 to 0.0095% by mass.

36. (NEW) The copper-based alloy casting according to claim 7, wherein Zr is in the range of 0.0010 to 0.0095% by mass.